

REMARKS

Applicants have amended claims 1 and 13 to address indefiniteness issues.

Claims 1-14 stand rejected under 35 U.S.C. § 112, second paragraph as indefinite. Specifically, the examiner objects to the use of the term "substantially" indicating that it makes the claims indefinite. Applicants have amended claims 1 and 13 to remove said term. Therefore, this issue should now be moot.

Claims 1-9 and 13 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Herz (US 3,839,861) in view of Nowicki ("Earch to Orbit Transportation Bibliography, 3/20/99). Specifically, the examiner indicates that Herz discloses thermocouples to obtain temperature information for a propellant grain and that Nowicki teaches the fuel and oxidizer from a rocket can be toxic, corrosive, and hygroscopic. The examiner goes on to state that it would be obvious to remove the fuel and oxidizer from a propellant in order to make the propellant inert. Further, the examiner indicates it would have been obvious to one skilled in the art to combine this revision of the teachings of Nowicki with the teachings of Herz to obtain the present invention.

While applicants agree that it is known in the art to place thermocouples into propellant grains in order to obtain temperature data (which is stated within the background section of the present application's specification), applicants respectfully disagree with the assertions of the examiner as they pertain to the Nowicki reference and any combination of the references.

First, a propellant grain is a chemical formulation that is made by combining a fuel, an oxidizer, and a small amount of a binder material that assists in processing the formulation. Once these ingredients are combined, it is physically impossible to

"remove" the fuel and oxidizer from a propellant grain. For comparison, such an act would be similar to making spaghetti sauce from tomatoes, water, sugar, and salt and then attempting to remove the water, sugar, and salt to have tomatoes again. In essence, chemical compounds change when they undergo a chemical reaction. Therefore, it would not be possible to remove the fuel and oxidizer from a propellant grain as the examiner suggests.

Second, as alluded to above, the binder ingredient in a propellant formulation is an extremely small percentage of the overall product (normally only 3-5% of the total formulation). Thus, even if it were possible to remove the fuel and oxidizer as the examiner suggests, the binder ingredient would not be anywhere near large enough to simulate an entire propellant grain within a rocket motor.

Third, while it is correct that the binder ingredient in a propellant formulation is plastic or rubber, this ingredient is in a flowable, liquid or gel state, requiring containment in order to simulate a propellant grain. So again, even if it were possible to remove the fuel and oxidizer from a propellant grain and there were enough binder to simulate a propellant grain, the binder would be in a liquid or gel state (basically not useable for the present invention).


Fourth, there is no impetus to combine the references as the examiner suggests. Nothing in either reference states or implies that an inert material, preferably a hydriin rubber material, can simulate the temperature profile of a propellant grain. Simulating the temperature profile of a propellant grain is a key element of the present invention (and a limitation within all of the claims). Without this knowledge, one would never

combine Herz with any reference suggesting an inert material to obtain the present invention.

Based upon the above arguments, there are several elements of the present invention that are not disclosed or implied by the references and there is no impetus to combine the references. Therefore, the obviousness rejections noted above are improper.

Accordingly, applicant believes that claims 1-14 are in condition for allowance and respectfully requests the examiner to withdraw all objections and rejections and allow said claims. Should the examiner need more information regarding this matter or have further suggestions regarding this application, feel free to call the undersigned at 301-744-5603.

Respectfully submitted,



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